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REFERENCE COPY

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APOLLO APPLICATIONS
PROGRAM DIRECTIVE NO. 10

TO : Distribution FROM:

Harold T. Juskin
Director, Apollo Applications

SUBJECT: AAP Nonconformance Reporting and Corrective Action

- REF. : (a) Apollo Applications Reliability and Quality Assurance Program Plan, NHB 5300.5, May 1967 Edition, Paragraph 2.6
- (b) Apollo Applications Program Directive No. 11, Sequence and Flow of Hardware Developments and Key Inspection, Review and Certification Check-points
- (c) NPD 5300.8, MSF Quality Assurance Audit and Discrepancy Reporting, October 13, 1967
- (d) Apollo Applications Test Requirements, NHB 8080.3, October 13, 1967
- (e) NMI 8020.3A, Manned Space Flight Flash Reports
- (f) NMI 5310.1A, Reporting of NASA Parts and Materials Applications Problems
- (g) NPC 250-1, Reliability Program Provisions for Space Systems Contractors, July 1963 Edition, Paragraph 3.7
- (h) Apollo Applications Program Directive No. 13, AAP Failure Mode and Effect Analysis; Single Failure Point Identification and Control

I. PURPOSE

The purpose of this directive is to establish requirements for reporting and resolving nonconformances encountered in manufacturing, testing, using and modifying AAP flight and ground support equipment in order to minimize nonconformance recurrence and to insure adequate closeout of all nonconformances prior to flight. The term "nonconformance" includes, as used throughout this directive, failures and defects, as defined in Appendix A.

The specific objectives of this directive are as follows:

- A. To establish requirements for a closed loop nonconformance reporting and corrective action system.

- D. Each Center Apollo Applications Program Office will make provisions for a system for storage and rapid retrieval of nonconformance information.
- E. Reportable nonconformances as defined in IV.D will be assigned criticality classifications. Definitions of nonconformance criticality categories and guidelines for their assignment are included in Appendix C.
- F. A failure analysis will be conducted on all criticality 1, 1S, 2A, 2B and selected 3 nonconformances when the cause of the failure is not obvious without the use of laboratory or other special analysis techniques. Failure analysis may also be required for suspected hardware nonconformance or for marginal operation of the component regardless of criticality category.
- G. Nonconformances will be resolved through authorized and documented corrective action to preclude recurrence in follow-on hardware. Where a configuration change is required, the engineering document number implementing the configuration change and the effectivity shall be included in the corrective action documentation.
- H. Nonconformances will be investigated for recurrence. When a nonconformance does recur, analysis of the previous corrective actions will be accomplished as a part of nonconformance investigation.

IV. REPORTING TO NASA CENTERS

- A. The contractor or NASA activity identifying a nonconformance will record each nonconformance and will report nonconformances to the NASA Center with design responsibility as delineated in B, C, and D, below. If the contractor has design responsibility, he will report nonconformances as delineated in B, C, and D below to the cognizant NASA Center. The NASA activity with design responsibility will assure closeout of each nonconformance reported. The activity with design responsibility will be responsible for forwarding corrective action information to the reporting activity.
- B. For flight hardware, reporting will be initiated no later than start of post-manufacturing checkout of a stage or module.

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B. Report Contents, Schedules and Responsibility

1. Specific directions as to report schedules and content will be provided by the Director, AAP Reliability, Quality and Safety (Code MLR).
2. Reporting will be the responsibility of the Center having design cognizance over flight hardware and for launch related Ground Support Equipment (GSE).

VI. REQUIREMENTS FOR EXCHANGE OF SIGNIFICANT NONCONFORMANCE INFORMATION

Dissemination of significant nonconformance information to management, and exchange of selected nonconformance experience between activities using similar hardware is a required element of an effective nonconformance reporting and corrective action system. To this end, two NASA Management Instructions (NMI's) have been issued to provide the mechanism for the dissemination and exchange of information.

- A. Reference (e) is applicable when "Flash Reports" are submitted and shall be implemented by appropriate Center instructions.
- B. Reference (f) will be followed when reporting nonconformance occurrences regarding parts and materials. This NMI is applicable throughout the Apollo Applications Program and shall be implemented by appropriate Center instructions.

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Remedial Action - The action taken to restore nonconforming hardware to operational status.

Unsatisfactory Condition - Failure or Defect.

II. RECURRENCE CONTROL CLOSEOUT

- A. A nonconformance is closed for recurrence control action when assurance is provided that adequate action has been taken and is properly documented to preclude recurrence of the same problem on all existing and follow-on hardware. This action will normally consist of changes such as a design change, procedure change, further employee instruction, or tooling changes.
- B. Engineering changes are not considered adequate for closeout until they have been approved by the appropriate configuration control board, including establishment of an effectivity date. Other changes (e.g., procedures or operating manuals) are not adequate for closeout until they are documented and issued. Also, when subsequent requalification is required, engineering changes are not considered adequate for closeout until satisfactory completion of qualification tests.

NOTE: When applicable, a nonconformance report will be annotated "Not a Nonconformance" in lieu of "closed." For example, any nonconformance reported, that after investigation, is determined to be:

1. A suspected problem that is proven not to be an actual problem.
2. A problem traced to test equipment or operator error that has not affected the hardware being tested.
3. A problem involving prototype components.

The following guidelines shall be used in nonconformance criticality category assignment:

1. Criticality determination is not affected by the nature of the checkout where the current problem was discovered. Criticality is based on the potential effect at the most critical period of countdown and/or flight of the manned mission. Criticality applies to the hardware failure mode.
2. Criticality categories are also applicable when a Failure Mode and Effect Analysis (FMEA) does not identify the particular hardware or failure mode, but sound engineering judgment dictates that the problem could fit the above definitions (i.e., structural or electrical cabling problems involving critical components).
3. When a nonconformance is reported against hardware used in multiple applications, it shall be classified based on the most critical application.
4. Launch scrub (as distinguished from launch delay) is defined as a delay long enough to require re-tanking of propellants and/or reschedule of the launch to a later date.

UNITED STATES GOVERNMENT

Memorandum

: Distribution

DATE:

: Apollo Applications Program Manager, AA

: Apollo Applications Program Directive No. 10

Subject Apollo Applications Program Directive is distributed for your information and retention. It is anticipated that proposed RMI QA-68-2, "KSC Non-conformance Reporting and Corrective Action System", will provide implementing procedures.

Thomas W. Morgan
Thomas W. Morgan
Colonel, USAF

Attachment:
AAPD #10

Distribution:
See next page